

ARA1000 Series

Air-Bearing Direct-Drive Rotary Stage

High load-carrying capacity

High stiffness

Direct-drive brushless, slotless servomotor

Large aperture

Easily configured with AVL1000 for multi-axis applications



Aerotech's ARA1000 rotary actuator is well-suited for applications such as flat panel display processing that require articulation for large payloads. Multi-axis systems with high load inertia can suffer from mechanical instability that limits total machine throughput. The ARA1000 eliminates this problem through a proprietary design that significantly increases stage stiffness. The ARA1000 incorporates a standard 57.2 mm aperture which allows for easy pass-through of vacuum lines. The tabletop includes a standard mounting pattern that allows for easy chuck mounting.

Superior Design

The ARA1000 utilizes large air-bearing surfaces for high stiffness and load capacity in a low-profile design.

Cable management is simple and straight-forward with integral motor power and feedback connectors. Because the ARA1000 is a self-contained unit, it can be integrated easily into multi-stage stacks. Either a service loop or an integrated Aerotech cable management system (CMS) can be provided for a highly reliable solution.

Brushless Direct-Drive

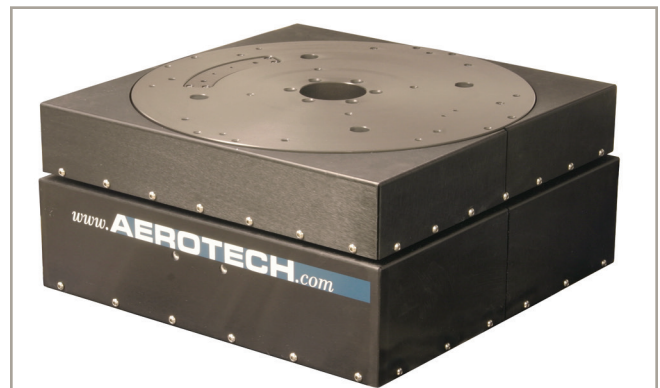
To maximize positioning performance, the ARA1000 utilizes Aerotech's S-series brushless, slotless motor. This motor has all the advantages of a brushless direct-drive motor — no brushes to wear, no gear trains to maintain, and high acceleration and high speeds. Since it is a slotless, ironless design, there is zero cogging, meaning that there is absolutely no torque ripple. This makes the ARA1000 ideal for applications requiring outstanding contoured motion or precise incremental steps. Zero backlash makes the ARA1000 the ideal solution for applications requiring frequent directional changes.

Accurate Positioning

Performance is assured with 150 line per degree encoder that results in 0.012 arc-sec resolution. The motor and high-performance rotary encoder are directly coupled to a common shaft.

Flexible Configurations

Aerotech manufactures a wide range of servo amplifiers and advanced controllers to provide a complete, integrated package.



The ARA1000 can be combined with the AVL1000 lift stage to create a high stiffness, multi-axis solution.

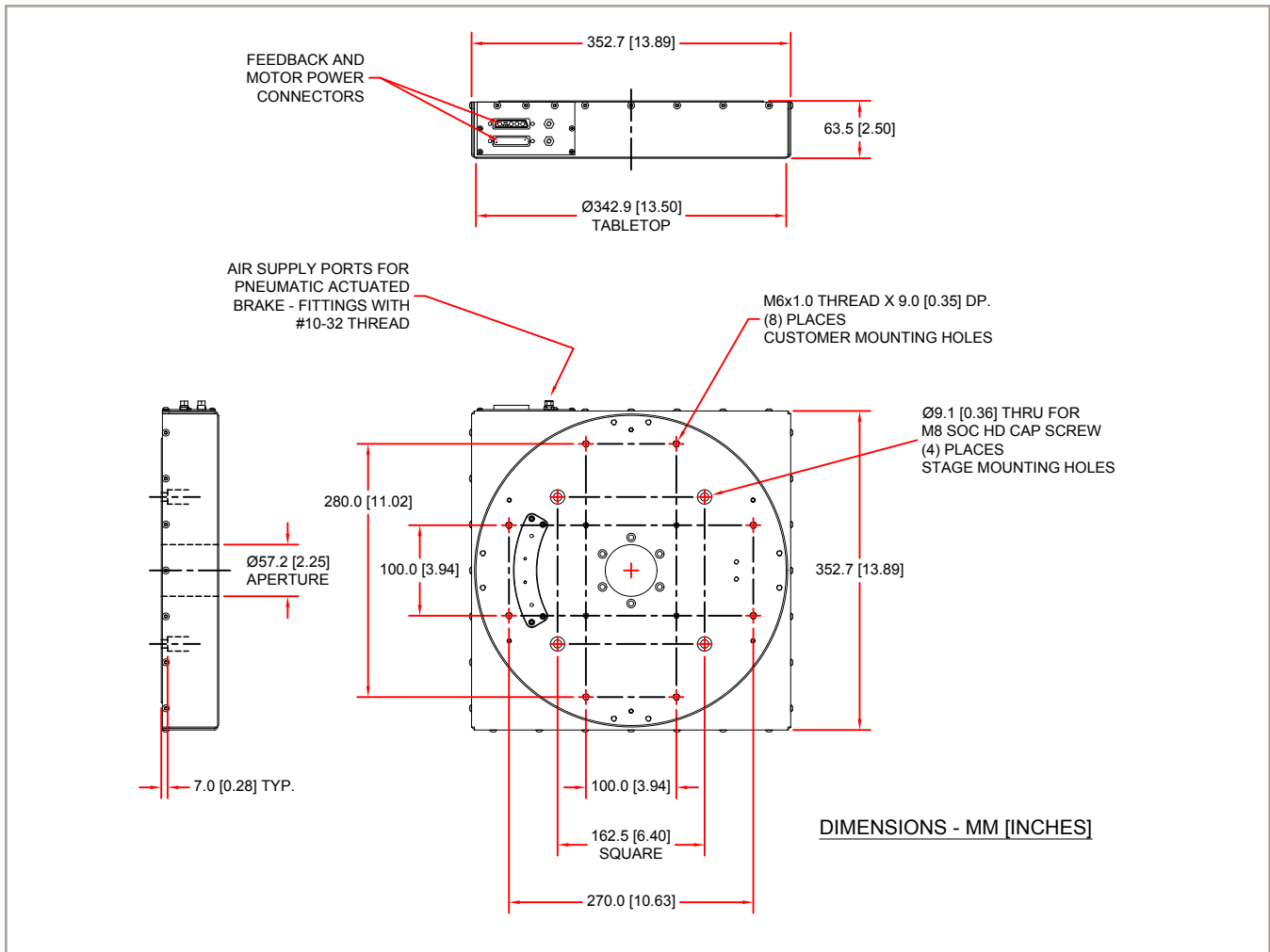
ARA1000 SPECIFICATIONS

ARA1000 Series		
Total Travel		100°
Bus Voltage		Up to 160 VDC
Accuracy ⁽¹⁾		±9.7 µrad (±2 arc sec)
Repeatability (Bi-Directional)		±4.85 µrad (±1 arc sec)
Maximum Load (Axial)		45 kg (100 lb)
Maximum Speed ⁽³⁾		60° per second
Rotating Inertia (Unloaded)		0.1203 kg-m ² (1.072 lb-in-s)
Operating Pressure ⁽⁴⁾		60 psig (4.137 bar) +0 psig (0 bar) -5 psig (-0.344 bar)
Vacuum Supply		21 "Hg ±2 "Hg ²⁾
Air Consumption ⁽⁵⁾		<56.6 SLPM (<2 SCFM)
Mass		17 kg (37.4 lb)
Finish	Tabletop	Hardcoat
	Stage	Black Anodize

Notes:

- Requires Aerotech controller for calibration and parts program implementation.
- Maximum speed is load dependent. Maximum application velocity may be limited by system data rate and resolution.
- To protect an air bearing against under pressure, an in-line pressure switch tied to the motion controller is recommended.
- Air supply must be clean, dry to 0° F dewpoint and filtered to 0.25 µm or better; recommend nitrogen at 99.9% purity.
- Specifications are for single-axis systems, measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Consult factory for multi-axis or non-standard applications.

ARA1000 DIMENSIONS and ORDERING INFORMATION



Limits (Required)

- LI1 Normally-closed limit switches
- LI2 Normally-open limit switches

Metrology (Required)

- PL1 Metrology, uncalibrated with performance plots
- PL2 Metrology, calibrated (HALAR) with performance plots

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

- TAS Integration - Test as system
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.
- TAC Integration - Test as components
Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system.